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SHELTERS AND SURVIVAL

by

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SHELTERS AND SURVIVAL

PRESIDENT KENNEDY's call for a new start in the nation's civil defense program is an integral part of the administration's over-all plan for meeting the current Berlin crisis. The apparent strategy behind the revised civil defense policy—spearheaded by a request for a tripling of federal appropriations for this purpose in fiscal 1962—is to convince Soviet leaders that Americans are ready to risk nuclear war, if necessary, to protect rights of access to West Berlin.

Congress on Aug. 10 granted the full \$207,600,000 asked by the administration for a start on a national fallout shelter program. This sum was in addition to \$86,550,000 already approved by Congress.¹ The President on Aug. 14 requested another \$73,200,000 for food and medical stockpiling programs. Still uncertain is congressional reaction to any long-range program of fallout shelter construction which may be submitted at the next session.

Frank B. Ellis, new director of O.C.D.M., is known to favor a five-year federal-state-local shelter program to cost up to \$20 billion, about half of it to be supplied by the federal government. President Kennedy himself has not made a decision on the advisability of such an extensive shelter program. No less in doubt than the reaction of Congress to a national shelter program is the reaction of the general public to current and future exhortations to take individual measures for self-protection. Past experience is not encouraging to advocates of stepped-up civil preparedness. A survey by a House Government Operations subcommittee last year showed that only 1,565 home fallout shelters had been built in the 35 states answering inquiries from the subcommittee.

PLANS FOR SHELTERS AND NEW WARNING SYSTEM

The President's purpose to press for new civil defense measures was brought forcibly to the public's attention on

¹ The \$86,550,000 figure represented a cut from the \$104,000,000 the President had sought for O.C.D.M.

July 25, when he addressed the nation on measures to meet a Soviet threat he described as "world-wide." He stated that "To recognize the possibilities of nuclear war in the missile age without our citizens knowing what they should do and where they should go if bombs begin to fall would be a failure of responsibility." Then he reported that he would ask Congress to appropriate new funds for the following immediate objectives: "To identify and mark space in existing structures—public and private—that could be used for fallout shelters in case of attack; to stock those shelters with food, water, first-aid kits and other minimum essentials for our survival; to increase their capacity; to improve our air raid warning and fallout detection systems, including a new household warning system . . . now under development, and to take other measures that will be effective at an early date to save millions of lives, if needed."

Kennedy added \$207-plus million to the approximately \$104 million previously requested for civil defense. He promised in the coming months to "let every citizen know what steps he can take without delay to protect his family in case of attack."²

The direct appeal of July 25 had been foreshadowed, May 25, in the President's special message to Congress on urgent national needs. At that time he had set forth in detail the reasoning behind his decision to revamp and expand the civil defense effort:

Civil defense . . . cannot be obtained cheaply. It cannot give an assurance of blast protection that will be proof against surprise attack or guaranteed against obsolescence or destruction. And it cannot deter a nuclear attack. We will deter an enemy from making a nuclear attack only if our retaliatory power is so strong and so invulnerable that he knows he would be destroyed by our response. If we have that strength, civil defense is not needed to deter an attack. If we should ever lack it, civil defense would not be an adequate substitute.

But this deterrent concept assumes rational calculations by rational men. And the history of this planet, and particularly the history of the 20th century, is sufficient to remind us of the possibilities of an irrational attack, a miscalculation, and accidental war, or a war of escalation in which the stakes by each side gradually increase to the point of maximum danger which cannot be either foreseen or deterred. It is on this basis that civil defense can be readily justifiable—as an insurance we trust will never be needed—but an insurance which we could never forgive ourselves for forgoing in the event of catastrophe.

² For full text of the July 25 speech, see *Congressional Quarterly*, Weekly Report of July 28, 1961, pp. 1319-1321.

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Defense Secretary Robert S. McNamara appeared before a Senate Appropriations subcommittee on the day after the President's broadcast address of July 25 to outline the administration's civil defense spending plans. Almost half of the additional \$207 million sought, he said, would be used to survey the shelter capabilities of existing buildings and to mark shelter areas in them. Another \$59 million would go to stock the shelters—which would be in the basements and hallways of existing large office, industrial, school and apartment buildings—with a five-day austerity food ration and a two-week water supply. Another \$10 million was being asked to increase the capacity of shelter areas by installing forced ventilation systems. Another \$7.5 million would cover the cost of including shelters in all new federal buildings.

A final \$38 million in additional appropriations would be used to develop better radiological detection systems, to carry out other research and development projects, and to try out a new home warning system. The identification and marking of shelter areas would be completed by December 1962, and "would concentrate first on the critical [metropolitan] areas, which are also likely to have the largest number of available spaces." McNamara said such shelter areas, when readied, would provide "reasonably adequate protection" for one-fourth of the nation's population, or about 46 million persons.

The President's program fell far short of the multi-billion dollar shelter program advocated by some civil defense specialists. Mass construction of fallout shelters was not included, nor did the President call for construction of individual family shelters, or a federal tax incentive to spur such construction. O.C.D.M. Director Ellis told the House Military Operations subcommittee on Aug. 2, however, that the group shelter program would be coupled with intensified efforts to get Americans to provide their own home shelters.

SHIFT OF CIVIL DEFENSE FUNCTIONS TO PENTAGON

The President decided after a survey of civil defense operations early in his administration that the effectiveness of any new program would depend in large measure on a sound organizational structure. The Office of Civil and Defense Mobilization and its predecessor agencies had

been under heavy congressional fire for years for poor management practices and contradictory policies. One critic, Sen. Stephen M. Young (D Ohio), had repeatedly characterized the civil defense effort as a "billion-dollar boondoggle."

Lacking confidence in earlier civil defense policies, Congress had been reluctant to vote funds for their execution. A total of \$619 million was spent on civil defense between 1950 and 1960, but this was only about one-fourth of the \$2.3 billion requested by the Truman and Eisenhower administrations during the decade. For fiscal 1961, Congress appropriated only \$60,125,000 for civil defense, a cut of \$16,225,000 from the funds requested by President Eisenhower.

To give civil defense a new look that might be more effective and at the same time more acceptable to Congress, President Kennedy on July 30 by executive order put the Defense Department in charge of the operational aspects of the forthcoming accelerated effort, and redefined the role of the director of O.C.D.M. The Secretary of Defense was directed to supervise the federal programs for protection of the civilian population against nuclear attack, including development and execution of a fallout shelter program, of a warning and communications system, and of a program to assist state and local governments in restoring such community services as health and sanitation, policing, fire-fighting, debris clearance, traffic control and provision of adequate water supplies after an attack.

The director of O.C.D.M. was assigned the task of assisting the President in planning, directing, coordinating and determining policy for "the total civil defense program," and was given continued responsibilities for planning for the continuity of federal, state and local governments, the natural disaster relief program, the defense mobilization program and the strategic and critical materials stockpiling programs. In general, O.C.D.M. will be largely freed of operating responsibilities. Its name was to be changed to the Office of Emergency Planning.

The decision to give the Pentagon responsibility for spending virtually all of the \$207 million in new civil defense money raised fears of military domination of the program in some quarters. Defense Department spokesmen emphasized that the Pentagon's part in civil defense

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would not change the program's "civilian character," and Secretary McNamara told the Senate Appropriations subcommittee on July 26 that civil defense operations would be carried out by a separate unit, under civilian control, attached to the office of the Secretary of Defense.

As recently as June 28 the Civil Defense Committee of the State Governors Conference, headed by New York Gov. Nelson A. Rockefeller, had urged continued civilian control of civil defense. The panel said that "policy control, direction and coordination [of civil defense] should remain under civilian authority in the executive offices of federal, state and local governments," and that, wherever possible, operational functions should be carried out by civilian authority. The extent of public concern over military control was seen in the widespread comment, some of it highly unfavorable, which developed in 1956 when President Eisenhower felt it necessary to issue a mock declaration of "limited martial law" during an Operation Alert civil defense exercise.³

CHANGES IN CIVIL DEFENSE SETUP SINCE THE WAR

Many civil defense specialists have held, however, that protection of the civilian population against nuclear attack is a job for highly trained military units, not for amateurs and volunteers. A permanent Office of Civil Defense under the Secretary of Defense was recommended in a report prepared soon after World War II by a temporary Office of Civil Defense Planning. The latter was a civilian group established by Defense Secretary James V. Forrestal to prepare a program for civil defense. The 1948 report's emphasis on peacetime organization gave rise to complaints that such an organization would produce intolerable regimentation of American life. The report never was officially adopted and President Truman in March 1949 placed responsibility for civil defense planning in the National Security Resources Board.⁴

Passage of the Federal Civil Defense Act in 1950 limited federal powers in the field largely to recommendation and guidance, with states and communities given primary responsibility for operations. Within a few years, critics were calling this law outmoded by changed concepts of

³ See "Civil Defense, 1956," *E.R.R.*, 1956 Vol. II, pp. 432-434.

⁴ See "Civil Defense," *E.R.R.*, 1950 Vol. I, pp. 43-44.

warfare, and asking for central planning of civil defense. The Commission on Intergovernmental Relations, reporting to President Eisenhower in June 1955, concluded that state and local governments had been made "primarily responsible for a function over which they are denied, by the realities of the problem, any significant degree of real policy formulation and technical leadership, and for which they are therefore unwilling to bear the preponderant financial burden."

Congress in 1958 replaced the Federal Civil Defense Administration and the Office of Defense Mobilization with an Office of Civil and Defense Mobilization. The 1958 legislation declared civil defense for the first time to be a "joint" responsibility of the federal, state and local governments, rather than the "primary" responsibility of state and local governments as stated in the policy declaration of the 1950 law. The added increment of federal responsibility, however, was restricted to the training and payment of more local civil personnel, and the purchase and distribution of radiological instruments. In the view of congressional critics, these additions did not alter the basic legislative foundation of federal civil defense or change the substantive program.

Numerous legislators began calling for a transfer of primary responsibility for civil defense to the Department of Defense. A special task force named by then President-elect Kennedy to study reorganization of the Defense Department (the Symington committee) recommended last Dec. 5 that there be established "a unified command in charge of the National Guard and Reserve elements of all the services; in addition to its other functions, this command would be responsible for civil defense." Sen. Young spoke favorably of this recommendation when he told the Senate on May 18 that "It is obvious to all that in event a nuclear war were to be suddenly waged against us, the President of the United States . . . would immediately declare a national emergency and place the armed forces in charge." President Kennedy's executive order restricting activities of O.C.D.M. and assigning operational functions to the Defense Department was regarded as an attempt to effect a compromise on the issue of civilian-military control of civil defense.

Conflicting Aspects of Shelter Policy

AT THE HEART of present American strategy in civil defense is the conviction that fallout shelters offer the best means of saving millions of lives in the aftermath of a nuclear attack. Mass evacuation of cities after warning of imminent attack—a concept designed for the day of the long-range bomber and “small” atomic bombs—has been made obsolete by fast-flying missiles and thermonuclear warheads, except in special situations. Such a special situation might be presented by an attempt by national leaders to demonstrate to the enemy, as a last resort, the readiness of the people to go to war on a particular issue.

It has been suggested that one of the steps President Kennedy might take to show this country's resolve to protect West Berlin, if access routes actually were cut off, would be to order evacuation of all non-essential population from major cities of the United States. Herman Kahn, a member of the physics division of the RAND Corporation, told a civil defense symposium in Washington, May 18: “There is nothing so convincing as to actually leave your cities and towns, put your people in a relatively safe place. Take 48 hours, not 24. Slow is better than fast here.” In reporting that this was the kind of strategy under consideration by the Kennedy administration, Richard Fryklund wrote in the *Washington Star*, June 16: “It is felt that the new plan not only could save scores of lives in time of actual war, but also could give American diplomacy a new lever in cold-war maneuvering.”

The director of civil defense for the District of Columbia disclosed, July 29, that he was preparing a plan for evacuation of all but 100,000 of the Washington area's 2,000,000 residents to pre-arranged destinations whenever the President decided that there was a real threat of nuclear warfare. Critics of the prior-evacuation strategy have suggested, on the other hand, that the enemy might interpret an evacuation order to mean that an attack on him was being planned, and launch his own attack first.

PROVISION OF SHELTERS TO HOLD DOWN CASUALTIES

Although President Kennedy has sought to minimize the deterrent role of civil defense, a number of specialists be-

lieve that a well-prepared and safeguarded populace can strongly reinforce a nation's nuclear deterrence posture. A Department of Defense directive issued July 28, 1960, stated: "The vulnerability of the civil population of the nation to nuclear attack may impair the ultimate utility, if not the combat capability, of our military forces."

Gov. Rockefeller has suggested that if an aggressor doubts the capacity of either the U.S. retaliatory force or the civilian population to survive an attack, "he may be tempted to destroy us."⁵ Without fallout protection, he warned, "it will take courage of heroic size to resist either nuclear blackmail or nibbling aggression."

Some Pentagon war studies have concluded that the aggressor in any nuclear war might well concentrate his first attack on military targets rather than the country's major cities. Almost by tacit agreement, the theory runs, the combatants might withhold attacks on cities to avoid retaliatory destruction of their own centers of civilian population. Allied military planners were reported by the *New York Times* in a Paris dispatch, July 15, to be considering "proposing an East-West agreement to avoid nuclear attacks on cities . . . in another war." There is question, of course, whether such an agreement would be honored by the combatants in an all-out nuclear war, particularly when one of them stood in danger of defeat.

The extent to which shelters could reduce casualties is a matter of dispute. Most authorities concede that there is no economically feasible way to save that part of the population exposed to the blast effect of a thermonuclear weapon exploded at or near the ground. Shelters would have to be located several hundred feet below the surface to withstand blast, shock and radiation effects at "ground zero."

President Kennedy stated in his July 25 address that in the event of attack, "the lives of those families which are not hit in a nuclear blast and fire can still be saved, if they can be warned to take shelter, and if that shelter is available." One projection on which his statement is said to have been based forecasts 70 million American deaths in any Soviet nuclear attack in the year 1963. Availability of fallout shelters to persons outside immediate target

⁵ Nelson A. Rockefeller, "Purpose and Policy," *Foreign Affairs*, April 1960, p. 377.

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areas presumably would cut casualties by one-half. A more optimistic study estimates that a combined blast and fallout shelter program could reduce the total casualties by "at least 90 per cent."⁶ At the opening of hearings, Aug. 1, before the House Military Operations subcommittee Defense Secretary McNamara said it was "probably a reasonable estimate that the identification and marking of existing fallout shelter space could, without additional effort, save at least 10 to 15 million lives in the event of a thermonuclear attack."

RELATION OF SHELTER PLANS TO ARMS LIMITATION

Not only would a shelter program save lives in a nuclear exchange, it has been argued, but with such protection the United States might feel safe enough to accept an arms limitation plan that afforded good, although not perfect, means of control and inspection. Lacking a shelter program in which some confidence could be placed, the United States would probably feel compelled to insist on a level of assurance in inspection and control to which the Soviet Union would never agree.

Atomic scientists have been revising earlier estimates on the time required for an area hit in a nuclear war to recover from heavy radioactive contamination. Ralph E. Lapp, a physicist, wrote in his book *Fallout* (1960): "There has been much in print about areas being denied to human habitation for years [after a hydrogen bomb attack]. This misconception is due in part to an actual over-estimate of the long-term radiation hazard." New calculations, he wrote, show a reduction in radiation hazards that "greatly modifies the shelter problem."

Edward Teller, who helped to develop the hydrogen bomb, estimates that radioactive contamination would be most critical for about two weeks and that survivors then could emerge from shelters "to clean up and rebuild our nation." Herman Kahn, in his book *On Thermonuclear War* (1960), attempted to assess the recuperative powers of a nation the size of the United States based on the number killed in a nuclear attack. With 20 million dead, Kahn says "economic recuperation" would take 10 years; with 40 million dead, 20 years; with 80 million dead, 50 years. "The survivors will not dance in the streets or congratulate each other if there

⁶ Marshall K. Wood (director of the National Planning Association's Post-Attack Resource Management Project), "The National Security Dilemma," *Looking Ahead* (N.P.A. Bulletin), November 1960, p. 1.

have been 20 million men, women and children killed, yet it would have been a worthwhile achievement to limit casualties to this number."

QUESTIONING OF UTILITY OF SHELTERS FOR SURVIVAL

Frequent assertions that surviving a thermonuclear attack, perhaps horribly burned, would mean a "life not worth living" are seen by civil defense officials as a serious obstacle to acceptance of huge expenditures for protective measures, particularly elaborate shelter programs. Kahn himself has asked, "Will the survivors envy the dead?" but concluded that "It is better to have a country after the war than not; and it is better to have a larger country than a smaller country."

Military leaders have on occasion opposed an all-out national shelter program on the ground that the expenditure would not be justified when weighed against alternative requirements of no less or perhaps greater urgency. Gen. Curtis E. LeMay, Air Force Vice Chief of Staff at the time, told the House Military Operations subcommittee on March 30, 1960, that he questioned the wisdom of spending the \$20 billion that had been estimated as the cost of carrying out the subcommittee's shelter proposals.

I don't think I would put that much money into holes in the ground to crawl into, that I would rather spend more of it on offensive weapon systems to deter the war in the first place. In other words, I see any great expenditure for this sort of thing to be what I call a Maginot line concept, and I think it is doomed to failure.

Maj. Gen. John B. Medaris (Ret.), former chief of the Army Ballistic Missile Agency, has said the concepts of mass evacuation and shelters would "negate any kind of positive reaction" to attack. "It would convert our people into a horde of rabbits scurrying for warrens where they would cower helplessly while waiting the coming of a conqueror." Medaris urged the Nike Zeus anti-missile system as the "only conceivable and positive defense" that would be available in the next 10 years.

Doubts have been widely expressed that shelters built today would provide a realistic defense against tomorrow's nuclear weapons. Physicists believe new bombs could be developed that would "sear" areas as wide as six western states when exploded at altitudes of 300 miles. Moreover,

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the more sheltered the target, the heavier would be the attack and the more enduring its consequences.⁷

H. Bentley Glass, professor of biology at Johns Hopkins University and a member of the Advisory Committee for Biology and Medicine of the Atomic Energy Commission, has predicted that about 80 per cent of all Americans would be killed outright from nuclear blasts in any war with the Soviet Union while the Russians, because of their slightly greater dispersion, would suffer blast losses of 70 to 75 per cent. However, all the survivors in both countries would probably die from radiation fallout within two years.⁸ Author Philip Wylie, consultant to the Federal Civil Defense Administration under the Truman administration, has concluded that advent of the hydrogen bomb has made civil defense no longer feasible. He believes that repeated attack, massive firestorms, and the blinding of all persons who instinctively glance at the fireballs, even from a distance of 40 miles, are three effects surely to be expected in all-out war.

Kenneth Boulding, professor of economics at the University of Michigan and outspoken opponent of civil defense preparations, told a gathering of civil defense experts last spring: "I am not willing to have people say this about us, that the only thing we stand for is disaster and death and destruction, and that we offer the world no hope. That is what . . . civil defense has come to symbolize."⁹

RISK OF PROVOKING ENEMY BY CIVIL DEFENSE ACTION

Protective measures for civilian populations, because of their contribution to the over-all defense posture of a nation, are closely watched by potential enemies. The *Times* of London commented on Jan. 4, 1960: "The ironic truth is that precipitate civil defense, passive and humanitarian

⁷ Soviet Premier Khrushchev said in a Kremlin speech, Aug. 9, that the Soviet Union was able to construct a rocket with an explosive warhead equivalent to 100 million tons of TNT—five times the energy of the 20 megaton device with which present U.S. civil defense planning is designed to cope. Charles Shafer, chief of the plans office for chemical, biological and radiological defense for O.C.D.M., stated on Aug. 10 that the 100-megaton bomb envisioned by Khrushchev, if exploded on the ground, would cause virtually complete destruction and kill almost everyone within a radius of 12 miles. Between 12 and 20 miles, probably half the inhabitants would be killed, and buildings left standing be damaged beyond repair. Out to about 45 miles on a clear day there would be fires. The fireball would be three miles in diameter, with temperatures of about 18 million degrees fahrenheit. A 20-megaton bomb would cause complete destruction and kill virtually everyone within a radius of 6 miles and there would be widespread damage, with deaths of about half the people, in an area extending 6 to 12 miles from "ground zero."

⁸ Lecture at Johns Hopkins University, May 13, 1960.

⁹ Statement at first annual meeting of Office of Civil and Defense Mobilization—National Research Council Advisory Committee on Behavioral Research, May 19, 1961.

as it is, can alarm both friend and foe." President Kennedy's decision to increase civil preparedness was motivated, in part, by the hope that the Soviet Union would be put on notice that the United States is ready to fight if the Berlin crisis erupts into war.

Civil defense preparations may well be subject to misinterpretation. Initiation of an expanded shelter program, for example, might be viewed by an enemy as signaling a "pre-emptive" strike. A student of civil defense has written:

Suppose . . . that the Russians fear our first strike as much as we fear theirs. In that case, a massive shelter program initiated by either side would be a disequilibrating element in the balance of terror. With only ineffectual shelter measures, the [people] of each bloc are in effect nuclear hostages of the other. Putting them under protective cover deprives the other side of its hostages in proportion as the cover is—or is thought to be—effective.

So viewed, a national shelter program is by no means the innocent, passive, non-military defense measure it is usually pictured as being. It may be regarded as a preparation for attack, and when two blocs . . . distrust each other as deeply as do East and West at the present juncture, it will inevitably be so construed.¹⁰

The argument that a fallout shelter system might add dangerously to the risk of nuclear war has been set forth in a different light by David F. Cavers, Harvard law professor and a student of arms control and civil defense problems. As doubts of the adequacy of the shelters grow, Cavers stated in a letter to the *New York Times*, March 20, 1960, "so would pressures for us to grasp the advantage of the first strike." He asked: "What would convince the U.S.S.R. and even our allies that our intentions were only defensive, despite our continuous flow of war talk and a swelling, if underground, stream of first-strike argument?"

REJECTION OF PROPOSED SHELTER PLAN IN NEW YORK

Failure of shelter legislation to gain approval of the New York State legislature reflects the problems that in the past have obstructed efforts to obtain approval by Congress of a national shelter program. Shortly after Gov. Rockefeller took office in 1958 a special task force recommended a program for mandatory construction of fallout shelters in all public and private buildings in the state.

The State Defense Council offered a similar recommendation on Feb. 23, 1960, and on the following day Gov.

¹⁰ Carl Dreher, "Hazards of Civil Defense," *The Nation*, June 10, 1961, p. 492.

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Rockefeller met in closed session with some 200 members of the legislature to seek support for the plan. An unfavorable reception caused the governor to withdraw the mandatory shelter program and endorse instead a proposal for voluntary shelter construction with state tax inducements.

Even the tax incentive program was turned down by the New York legislature,¹¹ which instead adopted a resolution urging the federal government to develop a national civil defense program, including federal tax benefits for voluntary private shelter construction. The New York experience was cited by the House Military Operations subcommittee as underscoring the fact that "the states and localities cannot go it alone in meeting the requirements of civil defense today." The subcommittee declared that "Even the highest competence and imaginative leadership at the state level cannot suffice in the absence of a vastly increased federal effort in this vital field."

Basic Priorities in Civil Preparedness

ASIDE FROM PREPARATION of public fallout shelters, certain priorities have been established to improve civilian readiness for nuclear warfare. Heading the list is a better warning system to alert the population for an attack. The present system, linked to the Arctic radar "picket lines," can flash an alert to more than 400 central warning points in 15 seconds, but the relay to 5,000 more localities scattered all over the United States requires about 15 minutes.

Disaster experts say an effective warning system must accurately and rapidly transmit a clear, unique, unambiguous danger message that is instantly accepted as a sign for invoking pre-rehearsed, protective action by the public. The present system of sirens is believed to have been dangerously compromised by its use for tests and other purposes. One expert has declared: "Frequent repetition of the warning signal in a practice situation is like calling 'wolf' over

¹¹ Despite the setback, Rockefeller was able to get funds to build a shelter to house 1,100 legislators, secretaries and public employees in the basement of the capitol at Albany. Some 14,000 pounds of special crackers capable of providing a complete, balanced diet have been stockpiled in the shelter, which was completed last spring.

and over again when no wolf is present; when a real wolf appears, no one will believe you. . . ." ¹²

HOUSEHOLD BUZZERS TO WARN OF NUCLEAR ATTACK

A classified study prepared last year for the Army by the Operations Research Office of Johns Hopkins University is reported to have concluded that the nation's air-raid warning system was "basically unsound" and obsolescent. The study was said to have found that few persons heard outdoor sirens and fewer still paid any attention to them. It recommended installation of buzzer devices in homes, offices and plants. The recommended device, a small box that can be plugged into any standard electric outlet, would be set off by a voltage of specific frequency superimposed on local utility power networks.

This was the "household warning system" President Kennedy mentioned July 25 as warranting funds for improvement. Called the National Emergency Alarm Repeater (NEAR), it could be marketed on a mass scale for between \$5 and \$10. To make NEAR work, however, special generator-transformers costing \$60,000 each would have to be installed by each local utility power company—about \$50 million for the nation's 400 to 600 power systems. Presumably the system would alert the entire nation within one minute after receipt of the signal from the Air Defense Command in Colorado Springs.

Civil defense planners meanwhile are examining the adequacy of CONELRAD (Control of Electromagnetic Radiation), the nation-wide radio warning system. CONELRAD was started in 1948 at the request of the Air Force to prevent enemy bombers from finding targets by homing in on radio stations. Regular television and radio broadcasting is silenced when the North American Air Defense Command orders a radio alert, and 1,200 AM radio stations begin operations at reduced power on two wave-lengths, 640 and 1240 on the radio dial, for broadcasting emergency information and directions.

Military officials have said that modern radar in bombers and the use of missiles using no terminal radio guidance negate the advantages of the CONELRAD system. The Johns

¹² "Some Implications from Disaster Research for a National Shelter Program" (paper delivered by Charles E. Fritz of the University of Florida at a symposium on human problems in utilization of fallout shelters, Feb. 11-12, 1960, in Washington, D. C.).

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Hopkins report prepared for the Army is said to have made this point, and to have found in addition that CONELRAD information transmissions were weak in some areas and that many broadcasting stations experienced delays in switching to the system. It has been suggested that in place of CONELRAD, "powerful, clear channel stations should be designed to carry news and instructions to the populace."¹⁸

STORING OF FOOD SUPPLIES FOR USE IN SHELTERS

The Kennedy administration attaches urgency to the immediate stockpiling of food and medical supplies for use in event of an attack. A five-day austerity food ration and a two-week water supply for public shelters were the immediate goals spelled out by Defense Secretary McNamara after the President's July 25 speech. If standard canned goods are used for food, these will need replacing every few years. Most of the foods Americans consider to be non-perishable, including most canned and dehydrated products, are perishable when stored beyond the usual sale and consumption cycle, usually two years from time of packing.

Internal corrosion in tin cans generates enough hydrogen in 18 to 24 months to swell the cans. Eventually the cans will perforate from the corrosive action or rupture from the gas involved. In general, canned foods packed for domestic markets are not considered suitable for long-term storage as shelter rations. Most dried foods, moreover, are packed in flexible materials subject to deterioration or attack by rodents or insects. Agriculture Department scientists have developed a one-ounce processed wheat wafer containing 70 calories which would remain usable for three years. A day's supply for one person would cost 37c.

O.C.D.M. Director Ellis recommended to President Kennedy, July 7, that he assign to the Agriculture Department responsibility for estimating the food requirements of the nation following an attack and for making plans to assure the required availability of food for the surviving population until such time as adequate food production could be resumed. One possibility under consideration is transfer of large quantities of government-owned wheat to sites in and around 191 population centers to serve as emergency

¹⁸ Pat Frank, "Kennedy Should Put Civil Defense Under the Military," *Missiles and Rockets Magazine*, Dec. 12, 1960, p. 16.

food stockpiles. Wheat supposedly can be stored for long periods without deterioration and is highly resistant to contamination from radioactive fallout. Raw wheat could be boiled to make a palatable porridge.

In his Aug. 14 request to Congress for \$73,200,000 for stockpiling programs, the President said \$47,200,000 was needed by the Agriculture Department to transfer 126 million bushels of federally owned wheat from current storage sites to areas where food shortages might develop following an attack. The remaining \$26,000,000 would go to the Department of Health, Education and Welfare to expand an existing medical stockpile.

Some progress already has been made in the stocking of medical supplies. About 1,400 hospital units of 200 beds each costing \$212 million have been pre-positioned in 46 states, and medical supplies now constitute 94 per cent of the so-called "civil defense stockpile." Nevertheless, this medical stockpile would fall far short of meeting the needs in the aftermath of a nuclear attack. Evaluation of the Operation Alert, 1959, exercise indicated a loss of 88 per cent of the nation's productive capacity for health supplies and 75 per cent of health inventories.

Civil Defense in European Countries

THE WAY in which other nations, particularly the NATO allies and the Soviet Union, go about their civil defense planning and preparation is deemed of considerable importance to the United States. Civil defense is regarded as an important element of preparedness in Western Europe. And Soviet civil defense arrangements are studied closely for possible clues to future Kremlin military intentions.

STATE OF CIVIL DEFENSE READINESS IN WEST EUROPE

Although none of the nations of Western Europe can claim full civil defense readiness, Denmark, Norway, Sweden and Switzerland have civil defense laws of long standing which have been revised from time to time to meet additional requirements imposed by modern weapons. The people of all four countries are subject to compulsory civil

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defense service (usually between the ages of 16 and 65); in each nation large segments of the population have been trained in civil defense and large sums of money have been spent for shelter construction. Two of those nations—Sweden and Switzerland—are neutrals.

Sweden, with probably the most advanced civil defense program in the world, has extensive deep-rock, dual-purpose shelters and underground industrial facilities. Detailed instructions have been prepared for evacuation and housing in the countryside of 700,000 residents of Stockholm. In a nation of only 7½ million, there are one million trained civil defense personnel. All new housing projects undertaken since the end of the war have been required by law to incorporate shelters.

Other nations of Western Europe are markedly behind the Scandinavian countries in level of civil defense readiness. In Great Britain, the short warning time before missile attack and the relative smallness of the island have produced doubt as to the worth of civil defense preparation in a nuclear age. Limited shelter programs were begun several years ago in Belgium and the Netherlands, but the primary effort in each country has been geared to post-attack measures, rather than provision of shelters. France and Italy are almost totally lacking in civil defense preparedness, and West Germany only recently began to take measures after a long postwar interval of inaction.¹⁴

CONFLICTING REPORTS ON SOVIET CIVIL PREPAREDNESS

The limited amount of information that Western observers have acquired on civil defense capabilities of the Soviet Union is subject to conflicting interpretations. Foreign correspondents in Moscow regularly report an absence of outward signs of even the most elementary preparations. Air-raid drills are not held on a mass scale, and there are no street signs pointing to shelters. Osgood Caruthers reported in a dispatch from Moscow to the *New York Times*, July 8, that nothing that could be seen, heard or read in Moscow gave support to reports received from the United States that the Soviet Union had drawn up massive civil defense plans, allotted huge funds to the construction of shelters, and mobilized its people in a great preparedness campaign.

¹⁴ House Committee on Government Operations, *Civil Defense in Western Europe and the Soviet Union* (April 27, 1959).

In a direct reply to the Caruthers dispatch, Leon Gouré, senior staff member of the RAND Corporation, stated that "Most serious United States students of Soviet civil defense are now agreed that the Soviets are supporting an active and very substantial program in this field."¹⁵ Soviet civil defense measures are not normally discussed in the principal Soviet newspapers, Gouré said, and a policy of secrecy precludes posting of signs to show the location of shelters. Civil defense training is compulsory and is conducted for small groups in special quarters and in places of work and residence which foreigners are seldom allowed to see.

A congressional study of Soviet civil defense in 1959 stated that no conclusive information had been found on the number of shelters built in Soviet cities since World War II. O.C.D.M. Director Ellis told a House Appropriations subcommittee, April 10, that the Soviet Union was spending between \$500 million and \$1½ billion a year on fallout shelters, figures which indicated "that the great majority of the Soviet population would be protected from fallout." Gouré has written that plans are under way to use the Moscow, Leningrad and Kiev subway tunnels as shelter areas. The Moscow system could shelter up to two million persons or 40 per cent of the city's inhabitants.¹⁶ Entrances and exits are said to be equipped with special doors for protection against radiation.

Soviet authorities seem to have been torn between a desire to accelerate civil defense preparations and fear that such a program might spread undue alarm among a people whose memories of World War II are still vivid. Perhaps for this reason, Soviet civil defense for nearly 10 years after Hiroshima continued to be oriented toward protection against conventional bombing and chemical attack. The word "atomic" did not appear in any Soviet civil defense manual published as late as September 1953. It was not until 1958 that civil defense plans were revised to take into account such civil defense concepts of the nuclear age as partial evacuation of major cities. Thus the average Russian may be less aware of the true meaning of nuclear warfare than are citizens of the United States.

¹⁵ Letter to *New York Times*, July 21, 1961.

¹⁶ Leon Gouré, "What's Russia Doing About Civil Defense?", *Air Force Magazine* (monthly publication of the Air Force Association), August 1961, p. 58.

